

Autonomous Medical Operations (AMO)

Completed Technology Project (2017 - 2020)



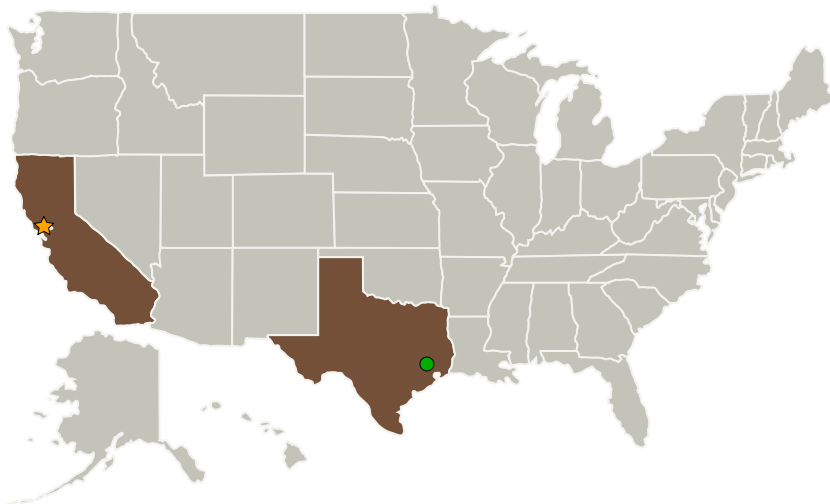
Project Introduction

This project will develop a “medical decision support system” to enable astronauts on long-duration exploration missions to operate autonomously while independent of Earth contact. Such a system is not intended to replace a chief medical officer, but rather to support the medical actions by providing advice and procedure recommendations during both emergent care and scheduled clinical reviews performed by crew.

Anticipated Benefits

The AMO on-board software system provides medical augmented intelligence for both planned and emergent clinical care aboard deep space exploration missions. The technology aims to mitigate medical misdiagnosis incidence, particularly when crewmembers operate outside their specialty training, as well as to guide and assist during clinical procedures. This has benefits in deep space as well as remote areas where the required medical expertise is not available.

Primary U.S. Work Locations and Key Partners



Autonomous Medical Operations

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Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Army Institute of Surgical Research	Supporting Organization	US Government	
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations

California	Texas
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Project Transitions

▶ **October 2017:** Project Start

✓ **September 2020:** Closed out

Closeout Summary: The AMO Project developed a prototype for an on-board software system that would provide medical augmented intelligence for both planned and emergent clinical care aboard deep space exploration missions. The technology aims to mitigate medical misdiagnosis incidence, particularly when crew members operate outside their specialty training, as well as to guide and assist during clinical procedures. To accomplish this, the AMO Project developed a set of computer medical analysis tools that can augment the clinician's ability to provide quality astronaut healthcare. The tools are packaged as a modular pipeline that prepares patient organ images (ultrasound and fundoscopic) and video clips for automated interpretation of diagnostic signs that likely indicate pathology. The system supports computer-aided image feature detection, and record content analysis for providing diagnostic advice.

Project Website:

https://www.nasa.gov/directorates/spacetech/game_changing_development/in

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Game Changing Development

Project Management

Program Director:

Mary J Werkheiser

Program Manager:

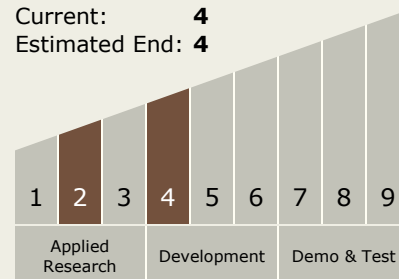
Gary F Meyering

Project Manager:

Kevin S Kempton

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4





Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.1 Sensing and Perception
 - └ TX04.1.3 Onboard Mapping and Data Analysis

Target Destinations

The Moon, Mars

Supported Mission Type

Push